

APPENDIX A

to

United States Patent Application

for

SYSTEMS AND METHODS FOR INTERPRETING COMMUNICATIONS PACKETS

```
#####  
# Ethernet-IP-TCP.pmd  
#  
#  
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#####
```

```
##### Structures #####
```

```
Struct 111, Ether, Ethernet Frame,  
    , Destination  
    , Source  
    , EtherType  
    , EtherPlds
```

```
Func 000, EtherPlds, Ethernet Payload,  
    , CaseOffset -16, 0800, IP  
    , CaseOffset -16, 0806, ARP
```

```
Struct 111, IPH, Internet Protocol Header, 160  
    , Ver  
    , IHL  
    , Type Of Service  
    , Total Length  
    , ID  
    , Offset 1  
    , MBF  
    , Last Frag  
    , FragmentOffset  
    , Time To Live  
    , IP Protocol  
    , Header Checksum  
    , Source Address  
    , Destination Address
```

Struct 001, Type Of Service, Type Of Service, 8

- , Precedence
- , S_Type D
- , S_Type T
- , S_Type R

Struct 111, ARP, Address Resolution Protocol, 224

- , HType
- , ARP Protocol
- , HWAddrLen
- , ProtAddrLen
- , ARP OpCode
- , HWAddressOfSender
- , ProtocolAddressOfSender
- , HWAddressOfTarget
- , ProtocolAddressOfTarget

Struct 111, TCP, Transmission Control Protocol Header, 160

- , Source Port
- , Destination Port
- , Seq Number
- , Ack Number
- , Data Offset
- , Offset 6
- , URG
- , TCP ACK
- , PSH
- , RST
- , SYN
- , FIN
- , TCP Window
- , TCP Checksum
- , Urgent Pointer

Struct 000, IP, Internet Protocol,

- , IPH
- , IPPlds

Func 000, IPPlds, IP Payloads,

- , CaseOffset -88, 06, TCP

Groups

Switches

Fields

Field, Destination, Destination Node Address, "", 48

Field, Source, Source Node Address, "", 48

Field, EtherType, Higher Layer Protocol Type, "", 16

, 0600, Xerox XNS IDP, Xerox XNS IDP
, 0800, IP, Internet Protocol
, 0801, X.75 Internet, X.75 Internet
, 0802, NBS Internet, NBS Internet
, 0803, ECMA Internet, ECMA Internet
, 0804, CHAOSnet, CHAOSnet
, 0805, X.25 Level 3, X.25 Level 3
, 0806, ARP, Address Resolution Protocol
, 0bad, Banyan Systems, Banyan Systems Inc.
, 6001, DEC MOP Dump/Load Assitance, DEC MOP Dump/Load Assitance
, 6002, DEC MOP Remote Console, DEC MOP Remote Console
, 6003, DEC DECnet Phase IV, DEC DECnet Phase IV
, 6004, DEC LAT, DEC LAT
, 6005, DEC DECnet Diagnostics, DEC DECnet Diagnostics
, 601[00XX], 3Com Corporation, 3Com Corporation
, 6014, 3Com Corporation, 3Com Corporation
, 700[000X], Ungermann-Bass download, Ungermann-Bass download
, 7002, Ungermann-Bass download, Ungermann-Bass download
, 7030, Proteon, Proteon
, 7034, Cabletron, Cabletron
, 8035, Reverse ARP, Reverse ARP
, 8046, AT&T, AT&T
, 8047, AT&T, AT&T
, 808[100X], Xyplex, Xyplex
, 808a, Xyplex, Xyplex
, 809b, Appletalk over Ethernet, Appletalk over Ethernet
, 80c[00XX], Digital Communication Associates, Digital Communication Associates
, 80d5, IBM SNA Services over Ethernet, IBM SNA Services over Ethernet
, 80f2, Retix, Retix
, 80f3, Kinetics, Kinetics
, 80f4, Kinetics, Kinetics
, 80f5, Kinetics, Kinetics
, 80f7, Apollo Computer, Apollo Computer
, 80ff, Wellfleet Communications, Wellfleet Communications
, 810[00XX], Wellfleet Communications, Wellfleet Communications
, 8137, Novell, Novell
, 8138, Novell, Novell

Field, Ver, Version, "", 4
 , 4, IP, Internet Protocol
 , 5, ST, ST Datagram Mode
 , 6, Ipv6, Internet Protocol v6
 , 7, TP/IX, The Next Internet
 , 8, PIP, The P Internet Protocol
 , 9, TUBA, TUBA

Field, IHL, Header Length in Words, "", 4

Field, Precedence, Precedence, "", 3
 , 0, Routine, Routine
 , 1, Priority, Priority
 , 2, Immediate, Immediate
 , 3, Flash, Flash
 , 4, Flash override, Flash override
 , 5, CRITIC/ECP, CRITIC/ECP
 , 6, Internet Control, Internet Control
 , 7, Network Control, Network Control

Field, S_Type D, S_Type Delay, "", 1
 , 0, Off, Normal Delay
 , 1, LOW, Low Delay

Field, S_Type T, S_Type Throughput, "", 1
 , 0, Off, Normal Throughput
 , 1, HIGH, High Throughput

Field, S_Type R, S_Type Reliability, "", 1
 , 0, Off, Normal Reliability
 , 1, HIGH, High Reliability

Field, Total Length, Total Length in Bytes, "", 16

Field, ID, Identification, "", 16

Field, MBF, May Be Fragmented Flag, "", 1
 , 0, Off, Fragmentation NOT Allowed
 , 1, Allowed, Fragmentation Allowed

Field, Last Frag, Last Fragment, "", 1
 , 0, Yes, This Is the Last Fragment
 , 1, No, This Is NOT the Last Fragment

Field, FragmentOffset, Fragment Offset, "", 13

Field, Time To Live, Time To Live, "", 8

Field, IP Protocol, Protocol, "", 8

- , 00, RSVD, Reserved
- , 01, ICMP, Internet Control Message
- , 02, IGMP, Internet Group Management
- , 03, GGP, Gateway-to-Gateway
- , 04, IP, IP in IP (encapsulation)
- , 05, ST, Stream
- , 06, TCP, Transmission Control
- , 07, UCL, UCL
- , 08, EGP, Exterior Gateway Protocol
- , 09, IGP, Any private interior Gateway
- , 0a, BBN-RCC-MON, BBN RCC Monitoring
- , 0b, NVP, Network Voice Protocol
- , 0c, PUP, PUP
- , 0d, ARGUS, ARGUS
- , 0e, EMCON, EMCON
- , 0f, XNET, Cross Net Debugger
- , 10, CHAOS, Chaos
- , 11, UDP, User Datagram
- , 12, MUX, Multiplexing
- , 13, DCN, DCN Measurement Subsystems
- , 14, HMP, Host Monitoring
- , 15, PRM, Packet Radio Measurement
- , 16, XNS, XEROX NS IDP
- , 17, TRNK1, Trunk-1
- , 18, TRNK2, Trunk-2
- , 19, LF1, Leaf-1
- , 1a, LF2, Leaf-2
- , 1b, RDP, Reliable Data protocol
- , 1c, IRTP, Internet reliable Transaction
- , 1d, ISOTP4, ISO Transport Protocol Class 4
- , 1e, NETBLT, Bulk Data Transfer Protocol
- , 1f, MFENSP, MFE Network Services Protocol
- , 20, MERIT, MERIT Internodal Protocol
- , 21, SEP, Sequential Exchange Protocol
- , 22, 3PC, Third Party Connect Protocol
- , 23, IDPR, Inter-Domain Policy Routing Protocol
- , 24, XTP, XTP
- , 25, DDP, Datagram Delivery Protocol
- , 26, IDPRCMT, IDPR Control Message Transport Protocol
- , 27, TP++, TP++ Transport Protocol
- , 28, IL, IL Transport Protocol
- , 29, SIP, Simple Internet Protocol

, 2a, SDRP, Source Demand Routing Protocol
 , 2b, SIPSR, SIP Source Route
 , 2c, SIPFRAG, SIP Fragment
 , 2d, IDRP, Inter-Domain Routing Protocol
 , 2e, RSVP, Reservation Protocol
 , 2f, GRE, General Rotuing Encapsulation
 , 30, MHRP, Mobile Host Routing Protocol
 , 31, BNA, BNA
 , 32, SIPPEP, SIPP Encap Security Payload
 , 33, SIPPAH, SIPP Authentication Header
 , 34, INLSP, Integrated Net Layer Security
 , 35, SWIPE, IP with Encryption
 , 36, NHRP, NBMA Next Hop Resolution Protocol
 , 3d, ANYHOST, Any Host Internal Protocol
 , 3e, CFTP, CFTP
 , 3f, ANYLOCAL, Any Local Network
 , 40, SATEXPAK, SATNET and Backroom EXPAK
 , 41, KRYPT, Kryptolan
 , 42, RVD, MIT Remote Virtual Disk Protocol
 , 43, IPPC, Internet Pluribus Packet Core
 , 44, DISTFS, Any Distributed File System
 , 45, SATMON, SATNET Monitoring
 , 46, VISA, VISA Protocol
 , 47, IPCV, Internet Packet Core Monitoring
 , 48, CPNX, Computer Protocol Network Executive
 , 49, CPHB, Computer Protocol Heart Beat
 , 4a, WSN, Wang Span Network
 , 4b, PVP, Packet Video Protocol
 , 4c, BRSAT, Backroom SATNET Monitoring
 , 4d, SUNND, SUN ND PROTOCOL - Temporary
 , 4e, WBMON, WIDEBAND Monitoring
 , 4f, WBEXPAK, WIDEBAND EXPAK
 , 50, ISOIP, ISO Internet Protocol
 , 51, VMTP, VMTP
 , 52, SECVMT, Secure VMTP
 , 53, VINES, VINES
 , 54, TTP, TTP
 , 55, NSFNET, NSFNET-IGP
 , 56, DGP, Dissimiliar Gateway Protocol
 , 57, TCF, TCF
 , 58, IGRP, IGRP
 , 59, OSPFIGP, OSPFIGP
 , 5a, SPRRPC, Sprite RPC Protocol
 , 5b, LARP, Locus Address Resolution Protocol
 , 5c, MTP, Multicast Transport Protocol
 , 5d, AX.25, AX.25 Frames

- , 5e, IPIP, IP-within-IP Encapsulation Protocol
- , 5f, MICP, Mobile Internetworking Control Pro.
- , 60, SCCSP, Semaphore Communications Sec. Pro.
- , 61, ETHERIP, Ethernet-withing-IP Encapsulation
- , 62, ENCAP, Encapsulation Header
- , 63, PRENCRYO, Any private Encryption Scheme
- , 64, GMTP, GMTP
- , ff, RSVD, Reserved

Field, Header Checksum, Header Checksum, "", 16

Field, Source Address, Source Address, "%\$i", 32

Field, Destination Address, Destination Address, "%\$i", 32

Field, HType, Hardware Type, "", 16

- , 0001, IEEE, IEEE 802 networks
- , 0006, IEEE, IEEE 802 networks

Field, ARP Protocol, ARP Protocol, "", 16

- , 0800, IP, IP Protocol

Field, HWAddrLen, Hardware Address Length, "", 8

Field, ProtAddrLen, Protocol Address Length, "", 8

Field, ARP OpCode, ARP OpCode, "", 16

- , 0001, REQUEST, ARP Request Packet
- , 0002, REPLY, ARP Reply Packet

Field, HWAddressOfSender, Hardware Address Of Sender, "", 48

Field, ProtocolAddressOfSender, Protocol Address Of Sender, "%\$i", 32

Field, HWAddressOfTarget, Hardware Address Of Target, "", 48

Field, ProtocolAddressOfTarget, Protocol Address Of Target, "%\$i", 32

Field, Source Port, Number of the calling port, "", 16

- , 0007, ECHO, Echo
- , 0009, DISCARD, Discard
- , 000b, USERS, Active Users
- , 000d, DAYTIME, Daytime
- , 0011, QUOTE, Quote of the day
- , 0014, FTP-DATA, File Transfer (Default Data)
- , 0015, FTP, File Transfer (Control)

, 0017, TELNET, Telnet
 , 0019, SMTP, Simple Mail Transfer
 , 0025, TIME, Time
 , 002a, NAMESERVER, Host Name Server
 , 002b, NICKNAME, Who Is
 , 0035, DOMAIN, Domain Name Server
 , 0043, BOOTPS, BOOTP Server
 , 0044, BOOTPC, BOOTP Client
 , 0045, TFTP, Trivial File Transfer
 , 004f, FINGER, Finger
 , 0050, HTTP, HTTP
 , 0066, ISO-TSAP, ISO-TSAP
 , 0067, X400, X400
 , 0068, X400-SND, X400-SND
 , 006f, SUNRPC, Sun Remote Procedure Call
 , 0089, NETBIOS-NS, NETBIOS Name Service
 , 008a, NETBIOS-DMG, NETBIOS Datagram Service
 , 008b, NETBIOS-SSN, NETBIOS Service Service
 , 0092, ISO TP0, ISO TP0
 , 0093, ISO IP, ISO IP
 , 0099, SGMP, SGMP
 , 00a1, SNMP, SNMP
 , 00a2, SNMPTRAP, SNMPTRAP
 , 00a3, CMIP-Manage, CMIP/TCP Manager
 , 00a4, CMIP-Agent, CMIP/TCP Agent
 , 00c9, AT-RMTP, AppleTalk Routine Maintenance
 , 00ca, AT-NDB, AppleTalk Name Binding
 , 00cc, AT-ECHO, AppleTalk Echo
 , 00ce, AT-ZIS, AppleTalk Zone Information

Field, Destination Port, Number of the called port, "", 16

, 0007, ECHO, Echo
 , 0009, DISCARD, Discard
 , 000b, USERS, Active Users
 , 000d, DAYTIME, Daytime
 , 0011, QUOTE, Quote of the day
 , 0014, FTP-DATA, File Transfer (Default Data)
 , 0015, FTP, File Transfer (Control)
 , 0017, TELNET, Telnet
 , 0019, SMTP, Simple Mail Transfer
 , 0025, TIME, Time
 , 002a, NAMESERVER, Host Name Server
 , 002b, NICKNAME, Who Is
 , 0035, DOMAIN, Domain Name Server
 , 0043, BOOTPS, BOOTP Server
 , 0044, BOOTPC, BOOTP Client

, 0045, TFTP, Trivial File Transfer
 , 004f, FINGER, Finger
 , 0050, HTTP, HTTP
 , 0066, ISO-TSAP, ISO-TSAP
 , 0067, X400, X400
 , 0068, X400-SND, X400-SND
 , 006f, SUNRPC, Sun Remote Procedure Call
 , 0089, NETBIOS-NS, NETBIOS Name Service
 , 008a, NETBIOS-DMG, NETBIOS Datagram Service
 , 008b, NETBIOS-SSN, NETBIOS Service Service
 , 0092, ISO TP0, ISO TP0
 , 0093, ISO IP, ISO IP
 , 0099, SGMP, SGMP
 , 00a1, SNMP, SNMP
 , 00a2, SNMPTRAP, SNMPTRAP
 , 00a3, CMIP-Manage, CMIP/TCP Manager
 , 00a4, CMIP-Agent, CMIP/TCP Agent
 , 00c9, AT-RMTP, AppleTalk Routine Maintenance
 , 00ca, AT-NDB, AppleTalk Name Binding
 , 00cc, AT-ECHO, AppleTalk Echo
 , 00ce, AT-ZIS, AppleTalk Zone Information

Field, Seq Number, Sequence Number, "%u", 32

Field, Ack Number, Acknowledgement Number, "", 32

Field, Data Offset, Length of TCP Header in words, "", 4

Field, URG, Urgent Pointer Field Significant, "", 1

, 0, Off, Not Significant

, 1, Significant, Significant

Field, TCP ACK, Acknowledgement Field Significant, "", 1

, 0, Off, Not Significant

, 1, Significant, Significant

Field, PSH, Push Function, "", 1

, 0, Off, Off

, 1, On, On

Field, RST, Reset Connection, "", 1

, 0, Off, No

, 1, Yes, Yes

Field, SYN, Synchronize Sequence Numbers, "", 1

, 0, Off, No

, 1, Yes, Yes

Field, FIN, No more data from Sender, "", 1

, 0, Off, Off

, 1, No more, No more data

Field, TCP Window, Receive Window Size, "", 16

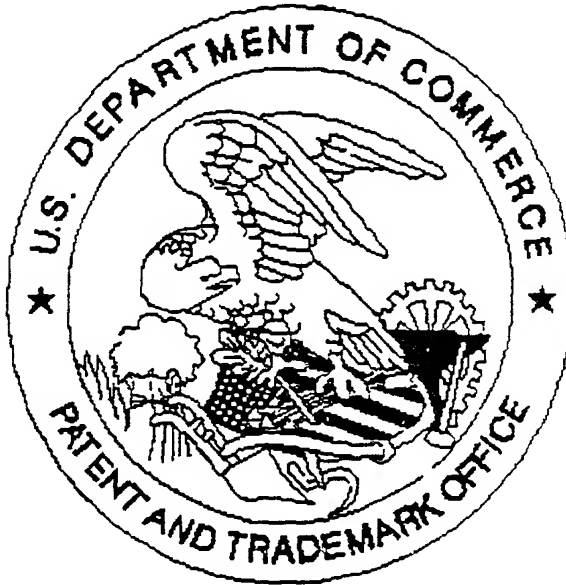
Field, TCP Checksum, TCP Checksum for header and data, "", 16

Field, Urgent Pointer, Points to first octet following urgent data, "", 16

Includes

[0118] What is claimed and desired to be secured by United States Letters Patent is:

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